



Caves and Fossils


Lesson Objective: This activity was designed to introduce students to paleontology, the natural resources of cave systems, and cave fossils.

Key Concepts: caves; fossils; paleontology; geologic time; sedimentary rocks.

Duration: 25 minutes*

* This is the 2nd half of a 55 minute lesson, and is designed as part of the **Sediments and Solution Caves: Part 1** lesson.)

Audience: Middle school and high school students



Caves and Fossils

Teacher Copy and Answer Key

CAVES AND FOSSILS~ TEACHER COPY

Background:

Our planet is a dynamic environment that has been continuously changing over the past 4.6 billion years. In order to make sense of these changes, scientists have developed a geologic time scale that separates the history of the Earth into distinctive periods of time. To accurately separate geologic time, paleontologists use clues, like fossils. These clues are used to reconstruct prehistoric environments and answer questions about the interactions between organisms and interactions between organisms and their environment. Fossils are critical resources to paleontologists because they represent life throughout history.

paleos or palaois = “old”
on = “being, creature”
logy or lego = “the study of”

Paleontology = the study of the forms of life existing in prehistoric or geologic times, especially as represented by fossils.

Questions:

- 1.) What is the name for the scale paleontologists use to separate the history of the Earth into distinct time periods?

GEOLOGIC TIME SCALE

- 2.) What is the definition of paleontology?

THE STUDY OF THE FORMS OF LIFE EXISTING IN PREHISTORIC OR GEOLOGIC TIMES, ESPECIALLY AS REPRESENTED BY FOSSILS.

National Parks and their Natural Resources¹:

Our national parks, and their extensive resources, are ideal places to learn about paleontology. Some parks, like Mammoth Cave National Park, have extremely diverse cave ecosystems that date back millions of years. The geologic time line for the formation of Mammoth Cave extends back millions of years starting from the Mississippian Period (359 – 318 million years ago)² and extending up into the Paleo-Indian Period (10,000 BC to 15 AD). Throughout this time fossils were continuously being formed, and researchers have found remnants that range from prehistoric marine organisms to bones washed into caves during times of flooding.

Question:

- 1.) Name the 2 geological time periods that witnessed the formation of Mammoth Cave.

THE MISSISSIPPIAN PERIOD AND THE PALEO-INDIAN PERIOD

¹ Source: *Introduction, Background, and Participation*; Sharon Ganci: Environmental Education Coordinator for Mammoth Cave NP.

² Source: NPS Views program – Geologic Time Knowledge Center.

Cave Fossils:

There are 2 ways that caves can house paleontological resources. First, fossils can be



preserved within the cave-forming rock and may become exposed through cave-forming processes. Second, fossils accumulate within the cave and karst features, such as in cave openings, sinkholes, and tubes. These features are natural traps for animals and can be important resources for paleontologists who use these accumulations to associate what types of organisms have inhabited an area.

Cave environments are conducive to the preservation of these paleontological resources. The relatively constant temperature and humidity of caves aid in the long-term preservation of organic material. Fossils formed inside the caves are protected from the harmful effects of solar radiation, as well as the forces of weathering and erosion.

Questions:

1.) Complete the following sentences about the 2 ways that fossils can form in caves:

- Fossils can be **PRESERVED** within the cave-forming rock.
- Fossils **ACCUMULATE** within cave and karst features, such as in cave openings, sinkholes, and tubes.

3.) What are 2 things that remain relatively constant in caves that aids in the preservation of fossil resources? **TEMPERATURE AND HUMIDITY**

Sedimentary Rocks

Of the 3 main types of rocks, igneous, metamorphic, and sedimentary, nearly all of the fossils that have been retrieved are found in sedimentary rocks. Sedimentary rocks form as pieces of sediment are redistributed and then re-consolidated, and as a result, fossils are often formed in the rocks as they solidify. Therefore, the formation of these rocks can tell us a great deal about the fossils they contain and also how they got there.

Questions:

1.) What are the 3 main types of rocks? **IGNEOUS, METAMORPHIC, AND SEDIMENTARY**

2.) In which type of rock are nearly all fossils found? **SEDIMENTARY**

3.) How do sedimentary rocks form?

THEY FORM FROM THE NATURAL PROCESS OF WEATHERING AS PIECES OF SEDIMENT ARE REDISTRIBUTED AND THEN RE-CONSOLIDATED.

Caves and Fossils

Student Copy



NPS Photo by Rick Wood

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- 2.) What is the definition of paleontology?

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- 1.) Complete the following sentences about the 2 ways that fossils can form in caves:
 - Fossils can be _____ within the cave-forming rock.
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- 3.) What are 2 things that remain relatively constant in caves that aids in the preservation of fossil resources?

Sedimentary Rocks and Fossils

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Questions:

- 1.) What are the 3 main types of rocks?
- 2.) In which type of rock are nearly all fossils found?
- 3.) How to sedimentary rocks form?